WHAT IS CLAIMED IS:

1. A semiconductor device having a plurality of wirings juxtaposed with one another and a SiOF insulating film being in contact with the wirings, characterized in that the fluorine concentration of the SiOF insulating film at a wiring gap portion is set to be higher than the fluorine concentration of the SiOF insulating film on the wirings.

2. The semiconductor device as claimed in claim 1, wherein the SiOF insulating film at a wiring gap portion comprises a first SiOF film and a second SiOF film formed on the first SiOF film, the SiOF insulating film on the wirings comprises the second SiOF film, and the fluorine concentration of the first SiOF film is higher than the fluorine concentration of the second SiOF film.

3. The semiconductor device as claimed in claim 2, wherein the thickness of the first SiOF film at a center of the wiring gap portion is within the range of 1/3 to 1/1 times of the thickness of the wirings.

4. The semiconductor device as claimed in claim 1, wherein the fluorine concentration of the first SiOF film is set to 5 atom % or more, and the fluorine concentration of the second SiOF film is set to be less than 5 atom %.

5. A semiconductor device having a plurality of wiring layers each having a plurality of wirings juxtaposed with one another and a SiOF interlayer insulating film, characterized in

that the fluorine concentration of the SiOF interlayer insulating film at a wiring gap portion is set to be higher than the fluorine concentration of the SiOF interlayer insulating film on the wirings.

6. The semiconductor device as claimed in claim 5, wherein the SiOF interlayer insulating film at a wiring gap portion comprises a first SiOF film and a second SiOF film formed on the first SiOF film, the SiOF interlayer insulating film on the wirings comprises the second SiOF film, and the fluorine concentration of the first SiOF film is higher than the fluorine concentration of the second SiOF film.

7. The semiconductor device as claimed in claim 6, wherein the thickness of the first SiOF film at a center of the wiring gap portion is within the range of 1/3 to 1/1 times of the thickness of the wirings.

8. The semiconductor device as claimed in claim 6, wherein the fluorine concentration of the first SiOF film is set to 5 atom % or more, and the fluorine concentration of the second SiOF film is set to be less than 5 atom %.

9. A semiconductor device manufacturing method, comprising:

a step of forming a plurality of wirings on the same plane;

a step of forming a first insulating film of SiOF on the plane having the wirings formed thereon and removing the first insulating film on the upper surface of the wirings;

a step of introducing fluorine into the first insulating film remaining at a wiring gap portion; and

a step of forming a second insulating film of SiOF.

10. The semiconductor device manufacturing method as claimed in claim 9, wherein the fluorine concentration of SiOF of the second insulating film is set to be equal to or less than the fluorine concentration of SiOF of the first insulating film before fluorine introduced.

11. The semiconductor device manufacturing method as claimed in claim 9, wherein fluorine is introduced by ion implantation under the condition of an acceleration energy of 10 keV to 100 keV and a dose amount of 5×10^{14} cm^{-2} to 3×10^{15} cm^{-2}.

12. A semiconductor device manufacturing method, comprising:

a step of forming a plurality of wirings on the same plane;

a step of forming a first insulating film of SiOF on the plane having the wirings formed thereon and introducing fluorine into the first insulating film;

a step of removing the first insulating film on the upper surface of the wirings; and

a step of forming a second insulating film of SiOF.

13. The semiconductor device manufacturing method as claimed in claim 12, wherein the fluorine concentration of SiOF of the second insulating film is set to be equal to or less than the

fluorine concentration of SiOF of the first insulating film before fluorine introduced.

14. The semiconductor device manufacturing method as claimed in claim 12, wherein fluorine is introduced by ion implantation under the condition of an acceleration energy of 10 keV to 100 keV and a dose amount of 5×10^{14} cm^{-2} to 3×10^{15} cm^{-2}.